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ABSTRACT

The concept of achieving mobility for outdoor teaching using a small mobile educational unit and the techniques of facilitating the mobility of equipment and supplies are discussed in this article. A small trailer unit can be used to enrich the learning experiences of students. Since the mobile educational unit is adaptable, it can be used as a classroom-laboratory on wheels. A trailer unit has many other advantages, such as: (1) the equipment can be conveyed to each school, thus saving individual schools from having to spend their limited budgets; (2) the equipment is always available and not mislead; (3) it is durable; (4) it can be constructed by school maintenance personnel or the industrial arts classes; (5) it can be utilized as a multi-purpose teaching station--i.e., a center for nature slide talks at night or a rolling nature center of live wildlife specimens; and (6) it can be used as a traveling field station for extensive and diversified field trips. Also given is a list of equipment and library references for the mobile educational unit. (NQ)

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THE MOBILE EDUCATIONAL TRAILER UNIT IN OUTDOOR TEACHING

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1970

The idea of a wheeled conveyance powered by a detached source of energy is very old in the history of mankind. Prior to the use of the wheel, early man probably employed straight poles and stretched animal skins as a means of increasing his personal payload. Carts and wagons appeared later and were developed for the purpose of conveying even greater payloads than man himself could drag, push, or carry on his shoulders or back.

The idea of a trailer unit was born when man attempted to increase the carrying capacity of his wheeled vehicle by adding another unit and at the same time utilizing the same power source for locomotion.

Trailer units find their American origins in the vast surge to the west of the nineteenth century. The Conestoga wagons moving westward on the Oregon and Sante Fe trails often pulled an auxiliary two-wheeled vehicle behind them. The idea of educational travel with a trailer is not new. It is actually a part of our American heritage, dating back to the period of time when thousands of pioneer settlers moved westward in search of new opportunities.

Farmers began to use trailers to carry a variety of their farm products. As the farmer became mechanized and the tractor became prevalent, the need for a separate unit became mandatory and the farm flat-bed trailer was originated.

Increased leisure time and increased disposable income led to the development of family camping and travel vacations. In a constant attempt to make the

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leisure time activity of a vacation camping experience more comfortable and expedient, the public has demanded the ultimate in travel trailers and other camping units.

This article will address itself to the concept of achieving mobility for outdoor teaching through the use of a relatively small mobile educational unit as a classroom-laboratory on wheels. Techniques of facilitating the mobility of equipment and supplies will also be discussed.

The concept of the mobile educational unit to be further described in this article was first envisioned at National Camp, a training center for teachers, administrators, conservationists, clergymen and other youth leaders interested in outdoor education. National Camp was supported up until 1951 by monies derived from Life Magazine for the purpose of developing and conducting meaningful outdoor living experiences for underprivileged and culturally disadvantaged children of New York City. The late Dr. Lloyd B. Sharp was director of Life Camps, Inc. and also director of National Camp. Dr. Sharp was a leading authority on outdoor education and a pioneer in its development. He was instrumental in the development of a small trailer unit as a means of extending exploration learning as a basis for getting acquainted with different environmental surroundings with people, their history, and how they live and learning about the works and wonders of nature. It was Dr. Sharp's contention that in seeking adventure and new experiences through the use of the trailer a youth could find a new dimension of security as they related themselves to the total environment and to the people with whom they must live.

It was at National Camp that this writer was introduced to the concept of trailer travel educational excursions. It was the writer's unique experience to

be assigned as a resource leader to a trailer travel youth group and came to realize the educational potential of this innovative notion. The writer was able to experience firsthand many of the positive values resulting from this mobile educational classroom.

It was Dr. Sharp's notion that the trailer unit could become the focal learning center of any land area reserved for educational purposes. Because the mobile educational unit was adaptable, program implications did not have to be confined solely to continuous travel over long distances which would normally take place during summer periods. The trailer was an effective educational tool which could be used by groups who wished to participate in outdoor education programs for a day, a weekend, or week-long periods of time. The trailer did not have to be consistantly on the go. The mobile educational unit could be taken into a particular base camp by a group where it could be set up, living conditions could be established, and the group could spend some time thoroughly exploring an area.

This enabled the fruition of the guiding principle which emphasized the acquisition of maximum available land rather than a minimum of land area caused by the premature need of constructing expensive facilities such as buildings. It was during the early development of the trailer unit that churches and agencies came to recognize the value of the mobile educational unit as a means of further enriching their respective camp programs for youth. When utilized by a church group or agency, trailer travel camping had within it the essential values for any decentralized small group camp program. It was the churches and a few agencies who came to realize the potential of the small camp group operat

ing on its own, planning its own program or itinerary, assuming increased responsibility, and meeting the challenge of food, shelter, self-occupation, spiritual uplift and group relationships.

It was Dr. Sharp's vision that the mobile educational units could be located in strategic positions on land allocated as an outdoor laboratory. It was while Dr. Sharp was on the faculty of Southern Illinois University that he projected the trailer units for use in stationary locations, as well as for the purpose of conveying equipment and reference resources to the surrounding school cities.

Unfortunately, Dr. Sharp's untimely death prevented him from viewing the fruition of his plan. It became the writer's responsibility to carry out aspects of Dr. Sharp's plan for outdoor education in the Southern Illinois area. The trailer design was modified from that of the earlier models which were utilized for trailer travel camping. The modifications provided for greater academic correlation with the on-going curricular program of the public schools and the provision of space for the storage of necessary equipment and reference material.

The original mobile education unit was designed with a variety of purposes in mind. It was classified as an all-purpose vehicle and contained all of the equipment and necessities which were needed to carry out a successful program. The original trailer was divided into three sections:

A. The right side was for cooking equipment, food storage, and food preparation.

B. The center section was for the storage of heavy equipment such as tents, ground cloths, extra canvas, tools, buckets for bucket cookery,

etc. Bed rolls and air mattresses were also stored in this section.

C. The left side was primarily for educational and library purposes and contained all resource materials, maps and charts, scientific equipment, first aid equipment, and tools which were used for craft activities. There was also a compartment for the storage of Sunday clothes.

The original trailer unit also had a canvas top which could be raised on movable ridge and support poles in order to provide additional shelter in the event of inclement weather.

The modifications of the trailer unit for use as an educational mobile unit included the following:

A. Elimination of the kitchen facility on the right side of the trailer, to become a program equipment and materials section.

B. The addition of a fourth section which ran across the front of the trailer for the purpose of storing long equipment items.

C. The elimination of the open space at the top of the trailer, adding a solid roof.

D. Canvas top became optional and was stored in middle section of trailer when not in use.

E. Addition of much more shelf space and special boxes for the storage of individual categories of equipment in all sections of trailer unit.

One side of the trailer is devoted entirely to the storage of reference books and materials. A drop leaf provides access to this section and also serves

as a work space for the purpose of writing notes and using the books and reference material more conveniently. The other side of the trailer contains program material such as hand lenses compasses, binoculars, microscopes soil testing equipment, increment borers etc. A drop leaf also serves as a work surface when using equipment. Formica is suggested as a surface for this drop leaf if mild acids and other liquids are to be used.

A front compartment which runs the whole width of the trailer and is accessible from either side provides storage space for such items as meter sticks, Biltmore sticks, long-handled insect nets, tripods for plane tables and sighting devices, yardsticks, and storage boxes for other long items.

The center section is designed for the storage of other large pieces of equipment such as shovels, saws, range poles, dip nets, assorted aquatic nets, aluminum and enameled flat pans for pond and stream studies, microscopes, vasculums, animal traps, etc. This section is accessible through two doors at the rear of the unit. A complete weather station can be mounted on the inside of the back doors. A weather vane and wind anamometer can be mounted on the roof and detached when not in use. A rain guage can also be mounted near the top of the trailer. A barometer, hygrometer and a maximum-minimum thermometer can be mounted and a small clip board or shallow sleeve can house the forms and other weather reporting materials.

Individual boxes are recommended for equipment and supplies. Each box should be labeled in accordance with its contents. A simple adhesive label will suffice. This will facilitate not only rapid acquisition of equipment and materials for the field study, but will also aid in a snap inventory and prevent loss of equipment.

Thus the trailer becomes an outdoor classroom on wheels. Any vacant lot, community or county park, school site, city street, alleyway, riverfront, stream, lake, swamp, marsh, beach or any other area of open space can become an outdoor laboratory.

Another economical feature of the trailer unit is that the equipment can be kept to a minimum amount and be conveyed to each school instead of each individual school attempting to purchase their own with limited budgets. Individual budgets may be pooled and both quality and quantity is facilitated. An example of this aspect of economy is illustrated by the fact that instead of buying microscopes or other such optics for each individual school, monies can be directed to one centralized set of optical equipment which can be conveyed to each school as the need arises.

Another advantage is that the equipment is always available and valuable time is not lost in searching for mislaid or forgotten equipment somewhere in a classroom or laboratory or possibly in another building.

A distinct advantage would be to employ a full-time supervisor or coordinator of the outdoor program and this person could travel from school to school within a system. The supervisor or coordinator could conduct demonstration lessons and leave equipment for teachers to use after he leaves for another school. The trailer unit would be accompanied by this resource person and would supplement his resourcefulness as a catalyst for curriculum enrichment through outdoor experiences. A full-time person assigned to the program is a guarantee that full attention will be directed to its implementation, conduction, and evaluation, three characteristics necessary for a sucessful program.

The trailer unit is desirable over a self-contained unit because of its durability. A vehicle such as a van may wear out in time; however, a trailer will last infinitely longer for only the tow vehicle will need to be replaced.

The trailer can be constructed by school maintenance personnel or the industrial arts classes. The latter is preferred because of the integration of basic concepts and skills with a practical problem-solving situation and the identification of service to the total school program. Trailer units can be constructed for a total cost of less than three hundred dollars in cases where labor was free. Equipping the trailer is not included in this cost figure. Much of the equipment and supplies to be placed in the trailer may be already owned by the school system. If not, then a budget needs to be formulated for this purpose. It will probably exceed the construction cost of the trailer by at least three times. The total cost is minute when evaluated in terms of the potential the educational unit has for enriching the curriculum of the school.

The mobile educational unit can also be utilized as a multi-purpose teaching station. During the school year it can be utilized by the academic program of the school; however, during the summer months it can serve as an added feature of a recreation or park program in the community or county. It can become an interpretative nature center and be transported from playground to playground or from park to park within the community or country.

An interpretative naturalist can utilize the trailer very effectively by adding his equipment and teaching material to the trailer. Perhaps the school system may elect to store their equipment and materials for the summer and just

loan the trailer to the interested agency. Agency and institutional cooperation can accept an equal share in the total cost of the unit and equipment, thereby minimizing the individual expenditure.

A system of indirect projection of slides or movies can enable the trailer to become a center for nature slide talks at night, either in a park or on a playground. A screen can be designed for the roof of the trailer, retracting back inside when not in use. The slide projector can be mounted inside the trailer with remote control extending to the naturalist or speaker standing outside of the trailer. A movie projector can be utilized in the same manner. All that is needed is an electrical power source. An amplifying system can also be projected for use with interpretative talks, slide lectures, nature recordings, music for square dances, etc.

The trailer could also be transformed into a rolling nature center with either live specimens of wildlife or of a preserved variety. Miniature exhibits or dioramas might be featured in the traveling nature wagon.

The trailer unit can also be used by a secondary school science program as a traveling field station and could make field trips of an extensive and diversified nature feasible. It could follow the school bus or even be towed by the school bus on such field trips. Both teacher and class can take to the field, where many of the things they have studied in the classroom appear in all their real dimensions. The trailer becomes the center of the field program and is the base of operations. Their outdoor laboratory might be anywhere in the sommunity, it might be a lake, a river or stream, a swamp, an abandoned stone quarry, a woodland, a sandpit, or an oceanic beach. The contents of the trailer unit could be changed to better serve the objectives of the field trip.

A canvas cover (described earlier) could be added to the trailer. It can be raised above the trailer and provide shelter for students to work during inclement weather. Folding aluminum or wooden tables are useful as additional work space either under the canvas or directly at the study site. Folding chairs or benches can also be included as functional equipment for this outdoor classroom. Both tables and benches can be stored in the center section of the trailer when not in use.

The trailer unit can also be used to extend field trips to an overnight experience or longer. The group also experiences other benefits of living and learning together. The group of students becomes self-contained and self sufficient because of the necessities of meeting the everyday problems of living and learning. Geographical separation from the school campus dictates that the individuals must rely upon the resources which may exist within the group, not only for living and learning necessities, but also for emotional expressions and reactions. In the midst of such close associations with little or no opportunity to confide in people outside of the immediate group, an individual must take stock of his own personal habits and attitudes which may tend to distrub and irritate others.

Thus the trailer becomes a resident learning center on wheels for youth. Accompanied by their teacher and additional resource personnel, the whole classroom of their living environment is available. Utilizing tents for sleeping purposes and the trailer for both program and food service, the group operates on a planned itinerary, including areas for scientific study as well as overnight campsites, points of interest, mail stops and telephone stops.

For a minimum of expenditure the program of outdoor science can be enrichment for the curriculum as well as conveying sensations of discovery and high adventure.

The following equipment and library references for the mobile educational unit are by no means conclusive and are merely suggestive:

A. The Trailer Reference Library

1. The Jacques Pictured Key Nature Series (William C. Brown Company, Dubuque, Iowa)

The living Things by Jacques
The Plant Families by Jacques
The Economic Plants by Jacques
Fresh Water Algae by Prescott
The Seaweeds by Dawson
The Mosses and Liverworts by Conrad
The Weeds by Jacques
The Spring Flowers by Cuthbert
The Fall Flowers by Cuthbert
The Grasses by Pohl
The Trees by Jacques
The Eastern Land Snails by Burch
The Spiders by Kaston
The Insects by Jacques
The Immature Insects by Chu
The Grasshoppers, Cockroaches and Their Allies by Helfer
The Beetles by Jacques
The Butterflies by Ehrlich
The Freshwater Fishes by Eddy
The Water Birds by Jacques and Oliver
The Land Birds by Jacques
The Mammals by Booth

(Note: This series is best utilized with Junior and Senior High School groups)

2. Golden Nature Guides - Edited by Herbert S. Zim (Golden Press, Inc., New York, New York)

Mammals
Non-Flowering Plants
Insects
Insect Pests
Trees
Butterflies and Moths
Fishes
Weather
Spiders and Their Kin
Reptiles and Amphibians
Rocks and Minerals
Seashells of the World
Stars
Birds
Fossils
Zoology
Pond Life

(Note: These books are useful with elementary as well as secondary school groups)

3. Putnam Series (C.P. Putnam & Sons, New York, New York)

Field Book for Nature Activities and Conservation by W. Hillcourt
Field Book of Freshwater Life by Klots
Field Book of North American Mammals by H. E. Anthony
Field Book of Eastern Birds by Leon A. Hausman
Field Book of Common Ferns by H. Durand
Field Book of Common Rocks and Minerals by F. Loomis
Field Book of Insects by Lutz
Field Book of Trees and Shrubs by F. Matthews
Field Book of Animals in Winter by A. Morgan
Field Book of Stars by W. T. Olcott
Field Book of the Skies by W.T. Olcott and R. Mayall
New Field Book of American Wildflowers by H. Richett
Field Book of Snakes by K.P. Schmidt and R.D. Davis
Field Book of Common Mushrooms by W. Thomas
Beginners Guide to Wildflowers by T. Hausman
Beginners Guide to Freshwater Life by T. Hausman

4. Peterson Field Guide Series (Houghton Mifflin Company, New York, N.Y.)

A Field Guide to Birds by Peterson
A Field Guide to the Shells by Morris
A Field Guide to the Butterflies by Klots
A Field Guide to the Mammals by Bart and Grossenheider
A Field Guide to Wildflowers by McKenney and Peterson
A Field Guide to Rocks and Minerals by Pough
A Field Guide to Animal Tracks by Murie
A Field Guide to Ferns by Cobb
A Field Guide to Reptiles and Amphibians by Conant

(Note: Useful with Junior and Senior High School groups)

5. Doubleday Nature Guides (Doubleday and Company, Garden City, N. Y.)

North American Game Fishes by F. LaMonte
Audubon Land Bird Guides by R. Pough
Wildflower Guide by E. T. Wherry
The Insect Guide by R. Swain
Audubon Water Bird by R. Pough
Marine Game Fishes of the World by F. LaMonte
The Mammal Guide by R.S. Palmer
Audubon Western Bird Guide by R. Pough
The Fern Guide by E. T. Wherry

(Note: These books are useful for Junior and Senior High School groups)

6. Nature Guild (Berkley, California)

Master Tree Finder by M.T. Watts
Master Flower Finder by M.T. Watts

(Note: Excellent for primary youth as well as secondary school groups)

7. Dover Publications (New York, New York)

Manual of Trees of North America
Trees of Eastern & Central United States and Canada by W. Harlow
Fruit and Twig Key to Trees & Shrubs by W. Harlow
North American Birds Eggs by Reed
How to Know the Wildflowers by W.S. Dana
The Moth Book by W. J. Holland
The Mushroom Handbook by L.C.C. Krieger
Field Book of Wild Birds and Their Music by F.S. Mathews
Handbook of Birds of Eastern North America by F.M. Chapman
How Plants Get Their Names by L.H. Bailey

8. Other Trailer Library References

Naming Birds at a Glance by Blackley and Jenkins
Science in Your Own Backyard by E. Cooper
Teach-Me Natural Science Flash Cards (National Audubon Society, New York)
Palmer's Field Book of Mammals by E. Palmer
Handbook of Natural History by E. Palmer
Handbook of Nature Study by A. Comstock
Science on the Shores and Banks by E. Cooper
A Guide to Birds' Nests by R Headstrom
The Book of Trees by W.C. Grim
The Amateur Naturalist Handbook by V. Brown
Nature Games and Activities by S. Carsell
Recognizing Native Shrubs by W. C. Grim
Recognizing Flowering Wild Plants by W.C. Grim
Golden Book of Nature Crafts by J. Saunders
Golden Book of Science by B. Parker
Golden Treasury of Natural History by B. Parker
Winter Science Activities by John M. Youngpeter
New Britton and Brown illustrated Flora of the Northeastern United States and Adjacent Canada by H. Gleason

9. Flash Cards and Assorted Guides

Audubon Flash Cards for Trees
Audubon Flash Cards for Flowers
Audubon Flash Cards for Animals
Baker Nature Study Packet by T. Baker
Tree-In (A Key to 100 Eastern trees) by P. Goff
Ferns of Northeastern United States by F. Wiley
McGraw-Hill Identification Cards on:
Reptiles
Birds
Mammals
Insects

SPECIAL NOTE: Individual boxes with three sides and one open side can be constructed for each series of books. A handle will facilitate ease in handling. Sets of books can be transported from the trailer to a work study area easily and prevent misplacement of books.

B. Equipment for Mobile Education Unit

Animals
- Live Traps (Hav-a-hart)
- Live traps (tin can homemade)
- Insect nets
- Beating nets
- Demonstration mammal skins
- Demonstration insect collection
- Animal holding cage
- Plaster of Paris for tracks
- Scat boards
- Predator cells

Aquatic Study
- Dip nets
- Enamel shallow p[illegible]
- Aluminum folding [illegible]ble
- Seine net
- Throw nets
- Plankton nets
- Secchi disk
- Aquatic thermometers
- Collecting jars
- Pond scopes
- Minnow traps
- Medicine droppers
- Plastic tubes for bottom sampling
- Reconna[illegible]nce bottom sampler
- Soundi[illegible] poles
- Plastic buckets
- Scoop sampler
- P H Kit

Arts and Crafts
- Crayons
- Pencils
- Pocket Knives
- Sharpening stones
- Clip boards (Homemade type from masonite or homosote Material)
- Drawing boards (made from masonite or homosote)
- Scissors
- Water colors
- Paint brushes
- Charcoal
- Glue
- Oil for sharpening stones

Forestry
- Increment borers
- Biltmore sticks (classroom-made)
- Tree caliphers
- Meter sticks
- Rel-o-scope for point sampling (classroom-made)
- Tree diameter tape (classroom-made)
- Logger's chain (classroom-made)
- Pocket cruiser sticks
- Tree Planting bars
- Clinometer

Mapping and Surveying
- Assorted wooden stakes
- Transit
- Hand held sighting levels
- Line levels
- 12" rulers
- Carpenter's levels

Plane tables
Hand held plane tables
Stadia rods or range poles
Compasses (Silva Type 5)
Protractors
100' and 50' steel measuring tapes
Pedometers
Yardsticks
Alidade
Graduated string or rope (knotted)
Red and white pieces of flagging or cloth
Angle mirrors
Jacobs staff
Clinometer
Hypsometer

Optical Equipment
Microscopes
Hand lenses
Stand magnifiers
Binoculars
Microscope slides
Light meters
Cameras
Lens paper
Mineral oil (for optics lubrication)
Tripods for cameras or scopes
Telescopes or spotting scopes

Plant Study
Plant presses
Vasculums
Meter sticks
Wire coat hanger rings (for plant incidence)
Wood frame and strung string for plant analysis of incidence
Trowels
Plastic bags

Paper Supplies
Graph paper
Construction paper
Drawing paper
Adding Machine paper
Index cards
Sandpaper
Brown paper
Paper towels
Lens paper

Rocks and Minerals
Geology hammers
Rock chisels
Rock hardness sets
Safety goggles (plastic)
Demonstration rock collection
Collecting cloth or burlap bags

Social Studies
Flint and steel fire making set
Fire by friction set
Games with native materials
Indian games equipment
Arrow head making kit
Mordants for vegetable dying
a. Ferrous sulphate, USP
b. Potassium Dichromate
c. Cobalt Chloride, ACS

Soil
Soil augers
PH testing kits
Berless funnels
Soil thermometers
Soil cutter for profiles
Soil borer

Tools

Pliers
Hammers
Trail axes
Folding shovels
Long handled shovel
Bow saws
Pruning shears
Hoe
Trailer jack
Lug wrench
Screw driver
Spade

Weather

Barometer
Maximum-minimum thermometer
Wind vane
Hand held anemometer
Rain gauge
Hygrometer
Sling psychrometers
Weather flags
Relative humidity slide rules
Cloud charts

Miscellaneous Equipment

Snake bite kits
Canvas shoulder packs
Plastic ground cloths
Masking tape
Canvas buckets
Assorted tin cans
Stopwatch
Collecting jars
Insect aspirators
Tongue depressors
First aid kits
Fire extinguisher
Indian fire pump
Isosceles right triangles
Armored thermometers
Plastic ponchos
Various hip boots or waders
Balls of string
Modeling clay
PH paper (Hydrion)
Formalin
Topographic maps
Parabolic ears
Portable tape recorders
Circular compass
Contact Goniometer
Percentage Protractor
Typewriter
Transect tape
Igloo cooler

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